SUBJECT INDEX

Abdominal ganglia, insect 327
  acetylcholine 343
  biogenic amines 347
    dopamine 350, 396
    histamine 358, 397
    5-HT 349, 396
    octopamine 357
  blowflies 396
  cockroach 395
  Drosophila 396
  functions controlled by 330
  GABA 344
  glutamate 344
  locust 392
  moth 392
  neuroactive substances 341
  neuropeptides 360, 397
    allatostatins 387
    allatotropins 385
    bursicon 388
    corazonin 387
    CRF-like diuretic peptides 382
    crustacean cardioactive peptide 368
    FMRFamide-related peptides 363
    leukokinin-related peptides 379
    myomodulin-like peptide 374
    pigment-dispersing factors 388
    proctolin 369
    pyrokinins, myotropins, PBANs and other FXPRLamide-related peptides 373
    tachykinin-related peptides 385
  organisation 330–341
  taurine 347
Abdominal nerves, insect, peripheral organisation and targets 333
Abdominal neurons, insect, organisation 335
Acetylcholine
  effect of adenosine A_2 receptors on release 172, 180
  induced pH changes in glial cells 85
  insect abdominal ganglia 343
  interaction with glutamate receptors in thalamus 62
  in nucleus tractus solitarius, cardiovascular control 32
Acetylcholinesterase, in brain in Alzheimer's disease 241
ACTH
  evolution 426
  stress 423
    central adaption syndrome 578, 585, 588, 592, 601
    fish 430
    immune response 435
    invertebrates 430
Adaption, stress 425, 570
  behaviour 570
  central adaption syndrome 593–598
  cortical and limbic systems 589
  developmental modification 600
  genetics 599
  HPA system 592
  monoaminergic systems 590
  psychopathology 598–603
Adenosine
  activation of A_2 receptors, origins 182
  effect on acetylcholine release 173
  effect on glutamate release 174
  neuroprotective effect in ischaemia 155
  in nucleus tractus solitarius, cardiovascular control 29
Adenosine-3',5'-monophosphate
  adenosine induced accumulation in brain 168, 180
  induced pH changes 91
  role in endothelial cells 260
Adenosine A_1 receptors
  adenosine A_2 receptor interaction 179
  in nucleus tractus solitarius 29
Adenosine A_2 receptors 168
  adenosine origin 182
  desensitization 181
  distribution in nervous system 169
  function in nervous system 172
    carotid body chemosensory activity 178
    locomotor activity and behaviour 177
    modulation of CNS control of autonomic function 178
    modulation of neuronal excitability 176
    modulation of neurotransmitter release 172
    modulation of synaptic plasticity 177
    seizures 177
  G-protein coupling 171
  interaction with other receptors 178
  molecular structure 170
  in nucleus tractus solitarius 29
  subtypes 169
  therapeutic implications 182
  up-regulation 181
H^+-Adenosine triphosphatase, glial cells 82
Na^+,K^+-Adenosine triphosphatase
  excitotoxicity 624
  in neocortex, hypoxia induced inhibition 138
Adenylate cyclase, in cerebral microvessels 259
Adrenaline
  evolution 428
  in nucleus tractus solitarius 32
  stress, invertebrates 430
Adrenal medulla
  cellular composition 309
  growth factors 308–320
    biological activities 319
    ciliary neurotropic factor 319
    fibroblast growth factors 309
    insulin-like growth factors 319
    interleukins 317
    neurotropins 318
    transforming growth factor-β 310
α1-Adrenergic receptors
  brain microvessels 259, 260
  central stress response 585
  nucleus tractus solitarius 31
α1-Adrenergic receptors
  nucleus tractus solitarius 31
β-Adrenergic receptors
  agonist-induced down regulation 561
  brain microvessels 259, 260
  central stress response 584, 591
  human diseases 564

nucleus tractus solitarius 32
regulation of G-protein-linked receptor expression 560
regulation of G-protein-linked receptor function 556
RNA binding proteins 562
After potentials, neocortical neurons 525
Ageing
Alzheimer's disease 242
loss of nigrostriatal dopaminergic neurons 6
metabolic abnormalities in neurological disease 615
AIDS
cannabinoids 302
cerebral endothelial cells 266
microglia 452
Alcohol, nucleus tractus solitarius and cardiovascular control 41
Allatostatins, insect abdominal ganglia 387
Allatotropins, insect abdominal ganglia 385
Alzheimer's disease
adenosine A_2 receptors 182
damage to basal forebrain cholinergic pathways 239
causes 242
excitotoxicity 618
metabolic abnormalities 615
microglia 453
selegiline 13
AM630 281
Amantadine, Parkinson's disease 9
Amines, interaction with glutamate receptors in thalamus 61
Amino acids, transport by cerebral endothelial cells 264
Aminoalkylindoles, binding to cannabinoid receptors 279, 280
1S,3R-Aminocyclopentane-1,3-dicarboxylate 58, 62
responses in nucleus tractus solitarius 24
2-[(2-Aminoethylamino)carbonylethyl-phenylethylamino]-5'-*N*-ethylcarboxamidoadenosine, binding in brain 169
α-Amino-3-hydroxy-5-methyl-4-isoxazolopropionic acid (AMPA) receptor 57, 616
neurodegeneration 623
in thalamus 58, 60, 64
α-Amino-3-hydroxy-5-methyl-4-isoxazolopropionic acid (AMPA) receptor antagonist, neuroprotective effect 154
4-Aminopyridine model of epileptiform discharge 533
Amoeboid microglia 442, 443
Amygdala
arousal of fear and anxiety 575–577
stress and noradrenaline release 581
Amyloid precursor protein
Alzheimer's disease 243
in chromaffin cells 321
Analgesia, neuropeptide FF 464, 481
Anandamide 276, 277
in brain 280
physiological and pharmacological actions 279, 280
Angiotensin II, in nucleus tractus solitarius, cardiovascular control 36
Angiotensin II receptors, in nucleus tractus solitarius 37
Angiotensin-converting enzyme, in brain microvessels 262
Anomalous rectification 523
Anoxic depolarisation 137, 154
Antigens, stress 435
Antioxidants, Parkinson's disease 7, 10
Anxiety
arousal 575, 582
cannabinoids 298
Apolipoprotein E, Alzhemer's disease 243
Arachidonic acid, metabolism in brain and other endothelial cells 256
Arginine, release in thalamus 67
Aspartate
effect of adenosine A_2 receptors on release 174
induced pH changes in glial cells 85
Associative brain, stress response 571, 602
Astrocytes, effect on cerebral endothelial cells 266
Atrial natriuretic peptide
effect on brain microvessels 261
in nucleus tractus solitarius, cardiovascular control 36
Autonomic function, adenosine A_2 receptors 178
Axonal labyrinths 120
Axonal regeneration 221
Axonal sprouting 221
Axoplasmic transport tracers 107

Baroreceptor afferent terminals in NTS, neurotransmitters 23–26
Baroreceptor reflex
adenosine A_2 receptors 178
neuromodulation 26–43
neurotransmitters 23
Barosensitive neurons 22, 23
Basal forebrain cholingergic neurons 220
degeneration and regeneration 229
Alzheimer's disease 239
basalo-cortical pathway 236
septo-hippocampal pathway 229
Basal ganglia, adenosine A_2 receptors in 169
Basalo-cortical pathway, degeneration and regeneration 236
BCECF, pH in glial cells 74
Behaviour
adenosine A_2 receptors 177
environmental demands and adaptive modification 570, 595–598
genetic influences 599
neonatal enucleation 204
neuropeptide FF 482
Bicuculline, epileptiform response in human neocortex 531, 539
Bioenergetics
excitotoxicity 623–627
neurological disease 614, 615
Biogenic amines
evolution 428
insect abdominal ganglia 347, 392, 396
stress 430, 432, 434, 581–585, 590
Black–white discrimination, effect of neonatal enucleation 204
Blood-brain barrier
endothelial cells 263
astrocyte influences 266
neuronal influences 267
microglia 443, 445, 447, 448
role in immune reactions 266

Blood pressure, adenosine A_2 receptors 178
Blowflies, abdominal ganglia 396
Bradykinin, in nucleus tractus solitarius, cardiovascular control 40
Brain-derived neurotrophic factor
  in adrenal medulla 318
  effect on basal forebrain cholinergic neurons 226, 231, 232
  Parkinson's disease 10
Brain oedema, effect of histamine H_2 receptor blockers 265
Brain-specific antigens, cerebral endothelial cells 266
Bridge transplants 232
Bursicon, insect abdominal ganglia 388, 394
Bursting neurons, neocortex 133, 135, 526, 546

619C89, neuroprotective effect 155
Cadherins 227
Caffeine
  interaction with adenosine A_2 receptors 177, 179, 181
  effect on locomotor activity 177
Calcitonin gene-related peptide
  in nucleus tractus solitarius, cardiovascular control 41
  sprouting of primary afferent fibres 119
Calcitonin gene-related peptide receptors, adenosine A_2 receptor interaction 180
Calcium
  excitotoxicity 626
  in neocortex, effect of hypoxia 138
  relationship with pH in glial cells 88
Calcium antagonists, neuroprotective effects in ischaemia 155
Calcium channels, pH changes 92
Calcium currents, neocortical neurons 525
Callitachykinins 385
Cannabidiol 277
Cannabinoids 276
  activation of receptors 278
  agonists 278
  antagonists 280
  endogenous ligands 280
  medical uses 302
  membrane perturbation theory 278
  neurobehavioural effects 296
Cannabinoid receptors 275–305
  activation 278
  endogenous ligands 280
  molecular biology, cloning 281–286
  protein structure 283, 285, 292
  tissue specific 282
Cannabinoid receptor genes
  cloning 281–286
  molecular and structural characteristics 286–295
    helix net 292
    intronless 286
    protein sequence analysis 292
  neurobehavioural specificity 301
Cannabinol 277
Capsaicin, deafferentation 119, 122
Carbon dioxide buffering, glial cells 82
Carbonic anhydrase, H^+ buffering in glial cells 78, 90, 94
Cardiovascular control, neurochemical modulation, nucleus tractus solitarius 21–53
  acetylcholine 32
  adenosine 29
  adrenaline 32
  alcohol 41
  angiotensin II 40
  bradykinin 40
  dopamine 30
  GABA 26
  glycine 28
  5-HT 33
  natriuretic peptide 35
  neuropeptide Y 34
  neurotransmitter at baroreceptor afferent terminals in NTS 23
  nitric oxide 28
  noradrenaline 31
  opioids and related peptides 38
  salt 41
  substance P and other tachykinins 39
  vasopressin 37
Carotid body, effect of adenosine A_2 receptors on chemosensory activity 178
Catecholamines, in nucleus tractus solitarius, cardiovascular control 30
Cell adhesion molecules 227
Cell death, microglia 443, 454, 456
Central adaption syndrome, stress 589, 593
  adaptions controlled by controllable experiences 595
  adaptions triggered by uncontrollable experiences 596
c-fos, effect of ischaemia 143
CGS 15943, binding in brain 169
CGS 21680
  effect on acetylcholine release 173
  binding in brain areas 169
    effect of guanine nucleotides 171, 172
  effect on GABA, glutamate and aspartate release 174
  effect on locomotor activity 177
  effect on neuronal excitability 176
  effect on noradrenaline release 175
  effect on seizures 177
Chemical deafferentation 199, 122
Chemosensory receptors, carotid body, effect of adenosine A_2 receptors 178
Chloride, in neocortex, effect of hypoxia 138
Chloride/bicarbonate exchanger, glial cells 79
Chloride current, pH changes 92
Cholecystokinin, in nucleus tractus solitarius, cardiovascular control 40
Cholera toxin B subunit, axoplasmic transport 108
Choline, transport by cerebral endothelial cells 265
Cholinergic neurons, basal forebrain 220
  degeneration and regeneration 229
    Alzheimer's disease 239
    basalo-cortical pathway 236
    septo-hippocampal pathway 229
Cholinergic neurons, insect abdominal ganglia 343
Cholinergic system, effect of adenosine A_2 receptors 172
8-(3-Chlorostyryl)caffeine(CSC), binding in brain 169
Chromaffin cells
  granins and amyloid precursor protein 321
  growth factors
    biological activities 319
  ciliary neurotrophic factor 319
  fibroblast growth factors 309
  insulin-like growth factor 319
  interleukins 317
  neurotrophins 318

transforming growth factor-β 310
Chromagranin A and B 321
Chromstatin 321
Ciliary neurotrophic factor, in adrenal medulla 319
Cockroach abdominal ganglia 395
acetylcholine 343
biogenic amines 353
motoneurons 337
neuropeptides 360–392
Collateral sprouting 223
forebrain cholinergic pathway 231
Colliculus superior, changes after neonatal enucleation 192, 202
Complex I, deficits in Parkinson's disease 616
Coping strategies, stress 573, 574, 595, 601
Corazonin, insect abdominal ganglia 387
Cortical command, movement, transmission 489–517
Cortical function
calcium antagonists 155
development 151
hypoxia induced alterations 135, 151
intrinsic cellular properties 132
ischaemia induced alterations 140, 152
lesions 144, 153
multiple causes of dysfunction 148
network properties 143
neuroprotective effects of glutamate antagonists 154
neuroprotective effects of neurotransmitters and neuromodulators 155
sodium antagonists 155
Corticosteroids, central stress response 586–589, 592, 598
Corticotropin releasing factor-like diuretic peptides, insect abdominal ganglia 382
Corticotropin-releasing hormone
evolution 426
stress 424
central adaption syndrome 575, 577, 579, 583, 585, 586, 588, 592, 601
immune response 434
invertebrates 430
CP 55,940 277, 280, 281
CP 66,713, effect on noradrenaline release 175
Cross-modal effects of neonatal enucleation 205
Crustacean cardioactive peptide, insect abdominal ganglia 368, 392, 395
C-type natriuretic peptide 35
Cutaneous inhibition of propriospinal premotoneurons 508, 513
6-Cyano-7-nitroquinoxaline-2,3-dione(CNQX) 24, 57, 59, 60, 85, 140
Cytokines
chromaffin cells 317
evolution 428
HPA axis 424
microglia 454
stress, invertebrates 432

DATATOP study 11
Degeneration, forebrain cholinergic pathways 229
Alzheimer's disease 239
basalo-cortical pathway 236
septo-hippocampal pathway 229
Depolarization
glial pH 87
hypoxia 135
ischaemia 141
proton activated 92
Depolarization-induced alkalization, glial cells 88
Desensitization, agonist-induced in G-protein-linked receptors 556
Development
cortical function
effect of hypoxia 151
effect of ischaemia 152
effect of lesions 153
fibroblast growth factor in adrenal medulla 310
microglia 442, 443, 455
modulation of stress responsiveness 600
neuronal plasticity induced by enucleation 191–218
neuropeptide FF receptors in brain 478
plasticity of primary afferent projections to dorsal horn 121
Dextromethorphan, neuroprotective action 154
Diabetes, nucleus tractus solitarius, neuropeptide Y 35
4',5'-Dimethyl-5,6-carboxyfluorescein, pH in glial cells 74
3,7-Dimethyl-1-propargylxanthine, binding in brain 169
1,3-Dipropyl-8-cyclopentylxanthine
effect on neuronal excitability 176
effect on noradrenaline release 175
1,3-Dipropyl-8-*p*-sulfophenylxanthine 29
Disfacilitation, propriospinal premotoneurons 501, 503–506, 513
Disinhibition model of epileptiform discharge 531
Diuretic peptides, insects 382
Dizocilpine, Parkinson's disease 9
L-Dopa, neurotransmitter at baroreceptor afferents in NTS 26
Dopamine
effect of adenosine A_2 receptors on release 175
catabolism and generation of hydroxyl radical in Parkinson's disease 5
central stress response 582, 591
evolution 428
insect abdominal ganglia 350, 353–357, 392, 396
metabolic compensation in Parkinson's disease 223
in nucleus tractus solitarius, cardiovascular control 30
stress, invertebrates 430
Dopamine D_1 receptors, adenosine A_2 receptor interactions 179
Dopamine D_2 receptors
adenosine A_2 receptor interactions 178
in nucleus tractus solitarius 30
Dopamine transporter blockers, Parkinson's disease 9
Dopaminergic neurons
age-dependent loss, Parkinson's disease 6
neuromelanin 8
oxidative stress 3
Dorsal horn 106
laminar and somatotopic organization of neurons 108
primary afferent projections 107
plasticity, adult 118
plasticity, neonatal 121
somatotopic organization 108
Dorsal rhizotomy 118
Dorsal unpaired median neurons, insect abdominal ganglia 339, 403
Dronabinol 279

Drosophila 396
acetylcholine 344
histamine 397
monoamines 396
neuropeptides 364–392, 396
Dynorphin-related peptides, central stress response 585

Eclosion hormone 389
Eicopentanoic acid, metabolism in cerebral endothelial cells 259
Emotional stress 433, 575, 594
β-Endorphin, central stress response 585
Endothelial cells, brain
common features with other organs
arachidonic acid metabolism 256
general markers 256
second messenger systems 259
synthesis and secretion of substances 261
unique features
biochemistry 262
function 262
induction of blood-brain characteristics 266
structure 262
Endothelins
in nucleus tractus solitarius, cardiovascular control 41
production by cerebral microvessels 262
Endothelium-derived contracting factor 262
Endothelium-derived relaxing factor 261
Endothelium-specific antibodies, cerebral endothelial cells 266
Enkephalin, central stress response 585
Enucleation, neonatal 191
behavioural studies 204
biochemical studies 211
changes in pial angioarchitecture 196
changes in retino-geniculo-cortical pathways 192
changes in visual callosal connections 195
cross-modal effects 205
mechanisms of plasticity 212
physiological changes 202
Environment
adaptive modification of behaviour 570, 601
Alzheimer's disease 243
Epileptic focus 147
Epileptiform activity, human neocortex *in vitro*
4-aminopyrine model 533
disinhibition model 531
inhibitory mechanisms 548
magnesium-free model 535
methodology 520
neuron characteristics 526
stimulus-induced activity 540
synaptic mechanisms 528
Ethopropazine, Parkinson's disease 9
5'-*N*-Ethylcarboxamidoadenosine (NECA) 29
effect on acetylcholine release 172, 174
binding in brain areas 169
effect on glutamate and aspartate release 174
effect on neuronal excitability 176
effect on noradrenaline release 175
Evolution, stress 426, 571
Excitatory amino acids
effect of adenosine A_2 receptors on release 174
microglia 454
neurotransmission in baroreceptor terminals in NTS 24
Excitatory amino acid receptors 616
pH changes in glial cells 84, 85
in thalamus 56
Excitatory postsynaptic potentials, human neocortical neurons 528
Excitotoxicity 237, 614
free radicals 626
impaired mitochondrial calcium buffering 626
inhibition of Na^+,K^+-ATPase 624
metabolic inhibition 619
neurological disease 618–627
Extracellular space, H^+ buffering 76

Facial nerve lesions, microglia 448
Fast spiking cells 133
Fatty acids, effect of neonatal enucleation on incorporation 212
Fear, arousal 575, 582
Fetal neuron transplants 235, 239
Fibroblast growth factors
chromaffin cells 309, 312, 313
Parkinson's disease 10
regeneration of CNS neurons 227
Fimbria-fornix lesions, degeneration and recovery 230
Fish, stress response 429, 433
Flexor carpi radicals H reflex 494–496
Fluorescent dyes, pH in glial cells 74
Fluoride-resistant acid phosphatase, sprouting of primary afferent fibres 119, 121
FMRFamide-related peptides
insect abdominal ganglia 363, 393, 395
neuropeptide FF 474
Focal ischaemia, neocortex 140
Forebrain cholinergic neurons 220
degeneration and regeneration 229
Alzheimer's disease 239
basalo-cortical pathway 236
septo-hippocampal pathway 229
Free radicals
excitotoxicity 626
generation in tissues 2
Parkinson's disease 3, 4, 7
FXPRLamide-releated peptides, insect abdominal ganglia 373

GABA
effect of adenosine A_2 receptors on release 174
induced pH changes in glial cells 83
insect abdominal ganglion 344, 346, 392
nucleus tractus solitarius, cardiovascular control 26, 41
$GABA_A$ receptors
neocortex 135, 529, 539, 548
effect of hypoxia 140
nucleus tractus solitarius, baroreceptor reflex 27
pH changes in glial cells 83
$GABA_B$ receptors
neocortex 135
effect of hypoxia 140
nucleus tractus solitarius 27
GABAergic neurons, thalamus 60, 65
GABAergic system in neocortex, effects of hypoxia, ischaemia and lesions 149, 156
Galanin, in nucleus tractus solitarius, cardiovascular control 41

Ganglia, insect abdominal 327
acetylcholine 343
biogenic amines 347
dopamine 350, 396
histamine 358, 397
5-HT 349, 396
octopamine 357
blowflies 396
cockroaches 395
Drosophila 396
functions controlled by 330
GABA 344
glutamate 344
locust 392
moth 392
neuroactive substances 341
neuropeptides 360, 397
allatostatins 387
allatotropins 385
bursicon 388
corazonin 387
CRF-like diuretic peptides 382
crustacean cardioactive peptide 368
FMRFamide-related peptides 363
leukokinin-related peptides 379
myomodulin-like peptide 374
pigment-dispersing factors 388
proctolin 369
pyrokinins, myotropins, PBANs and other FXPRLamide-related peptides 373
tachykinin-related peptides 385
organization 330–341
taurine 347
Gangliosides, neuronal regeneration 227, 237
GAP-43, neuronal regeneration 228
Gap junctional conductance, proton modulation 95
General adaption syndrome 422, 570
Genetics, stress responsiveness 599
Geniculo-cortical topography, changes after neonatal enucleation 193
Glial cells
effect on cerebral endothelial cells 266
effect of hypoxia-ischaemia 150
inhibition of axon regeneration 222
pH regulation and proton signalling 74
activity-induced transients 85
carbonic anhydrase 78
gap junctional conductance 95
H^+ buffering 76
H^+ pumps 82
hormone and growth factor induced changes 90
interrelationship between intracellular Ca^{2+} and pH 88
metabolism 96
methods of measurement 74
model of H^+ dynamics during neuronal activity 89
Na^+/H^+ and Cl^-/HCO_3^- exchangers 79
Na^+-HCO_3^- cotransporter 79
neuronal excitability 94
neurotransmitter-induced changes 83
steady-state values 75
synaptic transmission 92
thalamus, glutamate receptors 59, 65
Glial derived neurotrophic factor, chromaffin cells 317
Glial scar 222
Global ischaemia, neocortex 141, 149
Glucocorticoids
central stress response 586–589, 592
evolution 427
regulation of G-protein-linked receptor expression 560
Glucose
transport in cerebral endothelial cells 263
utilization in brain after neonatal enucleation 211
Glutamate
effect of adenosine A_2 receptors on release 174
baroreceptor terminals in nucleus tractus solitarius 23
adenosine interaction 30
ethanol interaction 41
excitotoxicity 618
free radicals 626
impaired mitochondrial calcium buffering 626
inhibition of Na^+,K^+-ATPase 624
neurological disease 614, 618, 620–627
induced pH change in glial cells 84, 86
insect abdominal ganglia 344, 345, 392
microglia 454
visual system, effect of enucleation 212
Glutamate antagonists, neuroprotective effects 154
Glutamate receptors 616
adenosine A^2 receptor interaction 180
baroreceptor terminals in nucleus tractus solitarius 24
excitoxicity and neurodegeneration 620
ischaemia and lesion induced neuronal dysfunction 154
pH changes in glial cells 84, 86
thalamus 56
glial participation 65
function 59, 63
interaction with other transmitters and modulators 61
location 58
γ-Glutamyl transpeptidase, endothelial cells 256
Glutathione
interaction with glutamate receptors in thalamus 62
Parkinson's disease 7
Glycine
interaction with glutamate receptors in thalamus 61
in nucleus tractus solitarius, cardiovascular control 28
Glycogenolysis, glial, effect of pH 96
Glycolysis, neuronal energy metabolism 614
N-Glycosylation site, cannabinoid receptors 294, 300, 301
G-protein 556
adenosine A_2 receptor coupling 171
G-protein-linked receptors 555
agonist-induced down-regulation 561
cannabinoid receptors 276, 278, 282
human diseases 564
regulation of expression 560
regulation of function 556
Granins 321
Growth factors
in chromaffin cells
biological activities 319
ciliary neurotrophic factor 319
fibroblast growth factors 309
insulin-like growth factor 319
interleukins 317
neurotrophins 318

transforming growth factor-β 310
induced pH changes 90
production by endothelial cells 262
regeneration in CNS neurons 227
Guanosine-3',5'-monophosphate, role in endothelial cells 260
Guanylate cyclase, in brain microvessels 260
GYK152466 154

H^+ buffering, glial cells 76
H^+ dynamics during neuronal activity, model 89
H^+/Na^+ exchanger, glial cells 79
H^+ pumps, glial cells 82
H^+ signalling
gap junctional conductance 95
membrane conductance 91
metabolism 96
neuronal excitability 94
synaptic transmission 92
H^+ sequestering, glial cells 79
Hair follicle afferents 109
somatotopy of dorsal horn neurons 110
Heart-rate reflex, neuromodulation 23, 26–43
Hemiplegia, propriospinal premotoneurons in residual motricity 513
Hereditary traits of stress responsiveness 599
Hippocampus
adenosine A_2 receptors 170
neuropeptide FF 469
stress-induced changes 590
Histamine, insect abdominal ganglia 353, 358, 361, 392, 397
Histamine H_2-receptors, cerebral endothelial cells 265
HIV, microglia 452
Horizontal–vertical discrimination, effect of neonatal enucleation 205
Hormones, induced pH changes 90
H reflex 493, 495, 505
HU243 277, 280
Huntington's disease
adenosine A_2 receptors 182
excitotoxicity 618, 620
metabolic abnormalities 616
Hydrogen peroxide, production by microglia 454
6-Hydroxydopamine, mediated parkinsonism 5
Hydroxyl radicals, Parkinson's disease 2, 5, 7
5-Hydroxytryptamine
central stress response 580, 582, 592
induced pH changes in glial cells 85
insect abdominal ganglia 349–351, 353–356, 392, 396, 403
interaction with glutamate receptors in thalamus 62
neuroprotective effect in ischaemia 155
in nucleus tractus solitarius, cardiovascular control 33
5-Hydroxytryptamine receptors
insect 349
nucleus tractus solitarius 33
5-Hydroxytryptamine 3 receptor antagonists, neuroprotective effects 156
Hypothalamic hypophyseotrophic system, stress response 578, 583, 592, 598
Hypothalamus, neuropeptide FF 471, 475
Hypoxaemia, effect on prostaglandin metabolism in brain microvessels 259
Hypoxia, effect on cortical function 135
development 151
intrinsic membrane properties of single cells 137
modifications in network characteristics 138

I-APE, binding in brain 172
I_M, neocortical neurons 524, 526, 530
Immune system
microglia 446
stress 422
antigens 435
fish 429
human 433
invertebrates 430
Immunotoxin 1921gG-saporin 230, 237
Inflammation, brain-specific antibodies in cerebral endothelial cells 266
Inheritance, stress responsiveness 599
Inherited degenerations, microglia 446
Inhibitory amino acids, nucleus tractus solitarius 26
Inhibitory postsynaptic potentials, human neocortical neurons 529
Injury, microglia 448
regeneration 455
Insect abdominal ganglion 327
acetylcholine 343
biogenic amines 347
dopamine 350, 396
histamine 358, 397
5-HT 349, 396
octopamine 357
blowflies 396
cockroaches 395
Drosophila 396
functions controlled by 330
GABA 344
glutamate 344
locust 392
moth 392
neuroactive substances 341
neuropeptides 360, 397
allatostatins 387
allatotropins 385
bursicon 388
corazonin 387
CRF-like diuretic peptides 382
crustacean cardioactive peptide 368
FMRFamide-related peptides 363
leukokinin-related peptides 379
myomodulin-like peptide 374
pigment-dispersing factor 388
proctolin 369
pyrokinins, myotopins, PBANs and other FXPRLamide-related peptides 373
tachykinin-related peptides 385
organization 330–341
taurine 347
Insulin, G-protein-like receptor regulation 559
Insulin-like growth factors, adrenal medulla 319
Integrins 227
Interleukins
chromaffin cells 317
evolution 428
microglia 454
neuronal regeneration 227
pituitary-adrenal activation 423
stress, invertebrates 432
Interneurons
depression in corticospinal pathways 505
spatial facilitation 492
Intestine, neuropeptide FF 484

Intracellular adhesion molecule-1, cerebral endothelial cells 266
Invertebrates, stress response 430
Inward rectification, neocortical slices 522, 523
Iodopravadoline 281
Ion channels, effect of protons 91
Ionotropic receptors 57, 616
  thalamus 58
Iron, free radicals and Parkinson's disease 7
Ischaemia
  cortical function 140
    development 152
    molecularbiological modifications 143
    pharmacological treatments of dysfunction 154
    subcortical structures 148
    trigger 142
  excitotoxicity 618
  microglia 451

Joining peptide, nucleus tractus solitarius, cardiovascular control 39

Kainate, induced intraglial acidification 85
Kainate receptors 616
  neurodegeneration 623
  thalamus 57, 58, 60, 64
KF17837, binding in brain 169
Kyte-Doolittle hydrophilicity plot, cannabinoid receptors 293, 296–299

Laminar organization
  dorsal horn neurons 108
  primary afferent projections 107
Lamotrigine 620
Lateral geniculate body dorsal nucleus, neonatal enucleation 192, 202
Learned helplessness 590, 596
Learning, neuropeptide FF 482
Lectins
  axoplasmic transport 107
  cerebral endothelial cells 263
Leucokinin-related peptides, insect abdominal ganglia 378–383, 399
Leucomyosuppressin, insects 364
Leucopyrokinin 373
Leucosulfakinin 364
Levonantradol 277
Limbic system
  adaptive modification and stress 589
  arousal of fear and anxiety 575
  neuropeptide FF 469
  noradrenaline release and stress 581
Lipid peroxidation, Parkinson's disease 8
Locomotor activity, role of adenosine A_2 receptors 177
Locus coeruleus, noradrenergic system and stress 577, 581
Locust abdominal ganglia 392
  motoneurons 337
  neuropeptides 363–392
  sensory neurons 336
Locust male accessory gland myotropin-1 386
Locust myoinhibitory neuropeptide 389
Locust ovary-maturing parsin 390–392
Locustamyotropin, abdominal ganglia 373, 374, 392, 393
Locustatachykinins, abdominal ganglia 385
Long-term potentiation, modulation by adenosine A_2 receptors 177

Lymphocytes, neuropeptide FF 483
Lymophokines, neuronal regeneration 227

Macrophage/microglia inhibitory factor 455
Macrophages, microglia 442
Magnesium-free model of epileptiform discharge 533
Malonate, neuropathological damage 619, 620
Marijuana, cannabinoid receptor genes 275–305
Mazindol, Parkinson's disease 9
Medulla, neuropeptide FF 474
Melanocyte stimulating hormone, in nucleus tractus solitarius 39
Melatonin, insect nervous system 349
Memantine 155
Membrane conductance, proton-mediated alteration 91
Membrane potential, excitotoxicity 624
Mental disease, stress 602
Metabolic compensation, brain damage 223
Metabolic inhibitors, neuropathological damage 619
Metabotropic glutamate receptors 58, 616, 617
  adenosine A_2 receptor interaction 180
  lesion and ischaemia induced neuronal dysfunction 154
  neurodegeneration 623
  nucleus tractus solitarius 25
  thalamus 59, 61, 64
Metallothionein, 6-hydroxydopamine-mediated parkinsonism 5
N-Methyl-D-aspartate (NMDA) receptors 57, 616, 617
  baroreceptor terminals in nucleus tractus solitarius 24
  excitotoxicity 618, 624
  neocortex 135, 529, 533
    epilepsy 547
    hypoxia 140
    ischaemia 141, 144, 149, 154
  neurodegeneration 620
  thalamus 59
    integrative function 64
    interaction with other transmitters and modulators 61
N-Methyl-D-aspartate receptor antagonists
  neuroprotective effects 154
  Parkinson's disease 9
N-Methyl-D-aspartate receptor gated ion channel, H^+ interaction 92
α,β-Methylene ADP 182
1-Methyl-4-phenyl-1,2,5,6-tetrahydropyridine, parkinsonism, oxygen free radicals 4
Microglia
  blood-brain barrier 446
  cell biology 453
  experimental models of function 446
    human diseases 452
    inherited degeneration 446
    traumatic lesions 448
  immune system 446
  ontogeny 442
  pharmacology 454
  programmed cell death 443
  regeneration 455
  visualization techniques 444
Microtubule associated proteins (MAPs) 228
Mitochondria, calcium buffering and excitotoxicity 626
Mitogens, proteins from chromaffin cells 320

MK-801
NMDA receptor and neurodegeneration 620, 624
neuroprotective effect 154
Mole rat 208
Monoamine oxidase B, Parkinson's disease, selegiline 11, 12
Monoamines
central stress response 581–585, 590
insect abdominal ganglia 347, 392, 396
Monocular enucleation, neonatal
behavioural studies 204
biochemical studies 211
changes in pial angioarchitecture 196
changes in retino-geniculo-cortical pathways 192
changes in visual callosal connections 195
cross-modal effects 205
mechanisms of plasticity 212
physiological changes 202
Morphine, neuropeptide FF interaction 464, 482, 483
Moth abdominal ganglia 392
acetylcholine 343
motoneurons 337
neuropeptides 363–392
sensory neurons 336
Motoneurons, insect abdominal ganglia 337
Motor control, propriospinal system 491–517
Motor synergies 513
Movement, propriospinal system 491–517
Multidrug transport protein P170, cerebral endothelial cells 265
Multiple sclerosis 266
microglia 453
Muscarinic receptors, nucleus tractus solitarius 32
Muscimol, induced intraglial acidification 83
Myelin basic protein, cerebral endothelial cells 266
Myoinhibitory peptides, insects 389
Myokinins, insect abdominal ganglia 378–383
Myomodulin-like peptide, insect abdominal ganglia 374–379
Myotropins, insect abdominal ganglia 373

Nabilone 277, 279, 298
NADPH-diaphorase, nucleus tractus solitarius 28
Natriuretic peptides, nucleus tractus solitarius, cardiovascular control 35
Natural killer, immunological effects of stress 433, 434
NBQX, neuroprotective effect 154
Neocortex
development 151
hypoxia induced alterations 135, 151
intrinsic cellular properties 132
ischaemia induced alterations 140, 152
lesions 144, 153
multiple causes of dysfunction 148
network properties 134
pharmacological treatment of ischaemia/lesion induced dysfunction 154
Neocortical neurons *in vitro* 519–554
choice of tissue 520
electrophysiological techniques 521
functional properties 539
intrinsic membrane electroresponsiveness 522
models of epileptiform discharges 531
preparation and maintenance of slices 521
synaptic mechanisms 528
Nerve grafts 232
Nerve growth factor
amyloid precursor protein synthesis 243
chromaffin cells 318
regeneration in CNS neurons 225, 231, 232, 235, 239
Schwann cells, axon regeneration 222
Nerve growth factor receptors 225
Neural plasticity, neonatal enucleation 191–218
Neurite-promoting factors 227
Neuroactive substances, insect abdominal ganglia 341, 400
Neurobiotin, neuron tracer 110
Neurohemal organs 334, 400, 405
Neurological disease
bioenergetics and glutamate neurotransmission 613
excitotoxicity 618–627
metabolic abnormalities 615
metabolic inhibition 619
Neuromelanin, oxidative stress and Parkinson's disease 8
Neuronal activity, pH changes 86
Neuronal degeneration, microglia 446, 448
Neuronal excitability
modulation by adenosine A_2 receptors 176
effect of pH changes 94
Neuronal regeneration 220
axonal 221
forebrain cholinergic pathways 229
Alzheimer's disease 239
basalo-cortical pathway 236
septo-hippocampal pathway 229
growth factors 227
intracellular markers 228
metabolic compensation 223
microglia 455
neurotrophic factors 225
terminal axonal sprouting 222
Neuron–glial metabolic communication 96
Neurons, insect abdominal ganglia 335–340
Neuron transplants 235, 239
Neuropeptides
central stress response 585
insect abdominal ganglia 360, 397
allatostatins 387
allatotropins 385
bursicon 388
corazonin 387
CRF-like diuretic peptides 382
crustacean cardioactive peptide 368
FMRFamide-related peptides 363
leukokinin-related peptides 379
locusts 342
myomodulin-like peptide 374
pigment-dispersing factors 388
proctolin 369
pyrokinins, myotropins, PBANs and other FXPRLamide-related peptides 373
tachykinin-related peptides 385
nucleus tractus solitarius, cardiovascular control 34
Neuropeptide A 464, 483
Neuropeptide FF 461–487
analogs 478
functions 481
hypothalamus and pituitary 471
limbic system 469
nucleus tractus solitarius, cardiovascular control 39

origin 474
pons and medulla 474
receptors 477
spinal cord 464
Neuropeptide Y, nucleus tractus solitarius, cardiovascular control 34
Neuroprotective therapy
lesion and ischaemia induced cortical dysfunction 154
Parkinson's disease 9, 13
Neurosecretory cells, insect abdominal ganglia 340, 381, 385, 387, 392, 397, 400
Neurotoxins, deafferentation 119, 122
Neurotransmitters
effect of adenosine A_2 receptors on release 172
induced pH changes 83
insect abdominal ganglion 343
neuroprotective effect in ischaemia 155
visual system, effect of enucleation 212
Neurotrophic factors
Parkinson's disease 9
regeneration in CNS neurons 225, 231, 232
Neurotrophins 3 and 4/5, chromaffin cells 318
Nicotinic receptor
adenosine A_2 receptor interaction 180
in nucleus tractus solitarius 33
pH changes in glial cells 85
Nigrostriatal dopaminergic neurons
age-dependent loss 6
neuromelanin 8
oxidative stress 3
Nitric oxide
insects 343
interaction with glutamate receptors thalamus 62, 67
nucleus tractus solitarius, cardiovascular control 28
Nodose ganglia 22
Nomifensine, Parkinson's disease 9
Noradrenaline
effect of adenosine A_2 receptors on release 175
evolution 428
interaction with glutamate receptors in thalamus 62
nucleus tractus solitarius, cardiovascular control 31
stress
central response 577, 581–585, 598
invertebrates 430
Nucleus basalis magnocellularis lesions 237
Nucleus tractus solitarius, cardiovascular control 21–53
acetylcholine 32
adenosine 29
adrenaline 32
alcohol 41
angiotensin II 36
bradykinin 40
dopamine 30
GABA 26
glycine 28
5-HT 33
natriuretic peptides 35
neuropeptide Y 34
neurotransmitters at baroreceptor afferent terminals 23
nitric oxide 28
noradrenaline 31
opioids and related peptides 38
salt 41
substance P and other tachykinins 39
vasopressin 37

Octopamine, insect abdominal ganglia 353, 357–359, 392
Opioids
analgesia and tolerance, role of neuropeptide FF 482
in nucleus tractus solitarius, cardiovascular control 38
stressors and secretion 585
Opioid receptors, neuropeptide FF 481
Optic nerve lesions, microglia 451
Oxidative phosphorylation, Parkinson's disease 3
Oxidative stress 2
Parkinson's disease 3
antioxidants 7, 10
free radicals 7
iron, transferrin receptors 7
neuromelanin 8
neuroprotective therapy 9
selegiline 10
zinc metallothionein 5
Oxygen free radicals
6-hydroxydopamine-mediated parkinsonism 5
MPTP model of parkinsonism 4

p75NGFR 226
Pain, neuropeptide FF 481
Pancreastatin 321
Paraventricular nucleus, stress response 579, 580, 585
Parkinson's disease 1, 2
adenosine A_2 receptors 182
age-dependent loss of nigrostriatal dopaminergic neurons 6
defect in mitochondrial oxidative phosphorylation 3
excitotoxicity 618
free radicals and antioxidants 7
iron, transferrin receptors 7
metabolic abnormalities 616
metabolic compensation 223
neuromelanin and oxidative stress 8
neuroprotective therapy 9
neurotrophic activity in chromaffin cells 320
oxidative stress and nigral neuronal death 3
oxygen free radicals and MPTP model 4
seligiline 10
zinc metallothionein and oxidative reactions 5
Paroxysmal depolarization shift, human neocortex 529, 532, 542, 543
Peptidergic interneurons, insect abdominal ganglion 400, 403
Peptides, central stress response 585
Pericytes 256
Peripheral nerve lesions, effect on dorsal horn 120, 122
Peripheral receptive field 106
Perivascular microglia 446
Perivisceral organs, insect 334
Periviscerokinin 389
P-glycoprotein, cerebral endothelial cells 266
pH regulation by glial cells 74
activity-induced transients 85
carbonic anhydrase 78
gap junctional conductance 95
H^+ buffering 76

H^+ pumps 82
hormone and growth factor induced changes 90
metabolism 96
methods of measurement 74
model of H^+ dynamics during neuronal activity 89
Na^+/H^+ and Cl^-/HCO_3^- exchangers 79
Na^+-HCO_3^- cotransporter 79
neuronal excitability 94
neurotransmitter induced changes 83
relationship with intracellular Ca^{2+} 88
steady-state values 75
synaptic transmission 92
Phagocytosis
microglia 446–448
stress, fish 430
Phaseolus vulgaris leucoagglutinin 110
Phenylglycine, metabotropic glutamate receptor antagonist 25
Pheromone biosynthesis-activing neuropeptide, abdominal ganglia 373
Photoreceptor degeneration, microglia 446, 449
Pial angioarchitecture, changes induced by neonatal enucleation 196
Pigment-dispersing factor, insect abdominal ganglion 388, 399
Pituitary, neuropeptide FF 471, 482
Plasticity
cortical lesions 144
cutaneous primary afferent projections to spinal dorsal horn 105
adult 118
neonatal 121
presynaptic 116
neuronal, neonatal enucleation 191–218
synaptic, modulation by adenosine A_2 receptors 177
Platelet-derived growth factor receptor, cerebral endothelial cells 263
Polyamines, neuronal regeneration 227
Polymicrogyria 153
Pons, neuropeptide FF 474
Potassium channel openers, neuroprotective effects 143
Potassium currents
human neocortical neurons 530
effect of protons 92
thalamus 64
Pravadoline 277
Primary afferent projections, spinal dorsal horn 107
plasticity, adult 118
plasticity, neonatal 121
Proctolin, insect abdominal ganglia 344, 369–373
Programmed cell death, microglia 443, 454, 456
Pronase, deafferentation 119
Proopiomelanocortin, central stress response 585
Propriospinal premotoneurons
cat 491
human 493
corticospinal excitation 499
feedback inhibition 501, 508
organization 512
residual motricity in hemiplegic patients 513
role in movement 503–513
Prostacyclin, cerebral vasculature 259, 261
Prostaglandins, metabolism in endothelial cells 256
Proteases, neuronal regeneration 228
Protein kinase, G-protein-linked receptor regulation 556, 558
Protein kinase C, brain microvessels 261
Protein kinase site, cannabinoid receptors 295, 300, 301
Proton signalling, glial cells
activity-induced pH transients 85
interrelationship between intracellular calcium and pH 88
model of H^+ dynamics during neuronal activity 89
neurotransmitter-induced pH changes 83
pH changes induced by hormones and growth factors 90
Psychopathology, stress 602
Psychosocial stress 573, 574, 593–598, 602
Pyrokinins, insect abdominal ganglia 373

Ramified microglia 443
Ranitidine, effect on brain oedema 265
Reactive synaptogenesis 121, 223
Receptive fields
dorsal horn 106, 108, 110, 112, 120, 122
sensory neocortex 135
visual system, effect of neonatal enucleation 202
Receptor supersensitivity 224
Rectification, neonatal neurons 522
Regeneration
CNS neurons 220
axonal 221
growth factors 227
intracellular markers 228
metabolic compensation 223
neurotrophic factors 225
terminal axonal sprouting 222
forebrain cholinergic pathways 229
Alzheimer's disease 239
basalo-cortical pathway 236
septo-hippocampal pathway 229
microglia 455
Repetitive firing, neocortical neurons 524
Respiration, adenosine A_2 receptors 178, 182
Retina
adenosine A_2 receptors 170
optic nerve lesion and microglia 451
photoreceptor degeneration and microglia 446, 449
Retino-geniculo-cortical pathway, neonatal monocular enucleation 192
Ricin, microglia activation 448
RNA-binding proteins, down-regulation of G-protein-linked receptors 562

Salt, nucleus tractus solitarius and cardiovascular control 41
Schizophrenia, adenosine A_2 receptors 182
Schwann cells, nerve regeneration 222
Secretoneurin 321
Seizures, adenosine A_2 receptors 177
Selegiline, Parkinson's disease 4, 10
Sensory transmission, thalamus, glutamate receptors 55–72
Septo-hippocampal pathway, degeneration and regeneration 229
D-Serine, interaction with glutamate receptors in thalamus 61
Skin, primary afferent projections to spinal dorsal horn, plasticity 105–129
SNARF, pH in glial cells 74

Social stress 426, 433, 573, 574, 593–598, 602
Sodium
  excitotoxicity 625
  in neocortex, effect of hypoxia 138
  nucleus tractus solitarius and cardiovascular control 41
Sodium antagonists, neuroprotection in ischaemia 155
Sodium conductance, thalamus, glutamate receptors 63
Sodium current
  neocortical cells 523
  pH changes 92
Sodium/hydrogen exchanger
  activation by hormones and growth factors 90
  glial cells 79
Sodium-bicarbonate cotransporter, glial cells 79
Somatic organization
  dorsal horn neurons 108
  primary afferent projections
    electrophysiology 112, 115
    intraaxonal labeling 109
    plasticity 118
    transganglionic labeling 108
Somatostatin, nucleus tractus solitarius 40
Somatostatin receptors, visual system, effect of enucleation 212
Spatial faciliation 492, 496
Spiking cells 133
Spinal cord
  adenosine A_2 receptors 170
  neuropeptide FF 464–469
Spinal dorsal horn 106
  laminar and somatotopic organization of neurons 108
  primary afferent projections 107
    plasticity, adult 118
    plasticity, neonatal 121
Spinocervical tract cells, receptive fields 108, 115, 116
Spreading depression, neocortex 138, 143, 152
Sprouting 221, 222
  Alzheimer's disease 241
  primary afferent fibres 118, 120, 122
SR141716A 276, 277, 281
Stab lesions, microglia 452
Stimulus-evoked pH transients 86
Stress, central consequences
  arousal of fear and anxiety 575
  central adaption syndrome 593–598
  cortical and limbic systems, adaption 589
  corticosteroid-mediated effects 586
  development 600
  environment and adaptive modification of behaviour 570
  hereditary traits 599
  HPA system 578
    adaptive modification 592
  monoamine-mediated effects 581, 590
  noradrenergic system 577
  peptide-mediated effects 585
  psychopathology 598
Stress, neuroimmunology 422–436
  antigens 435
  evolution 426
    ACTH 426
    biogenic amines 428
    corticotropin-releasing hormone 426
    cytokines 428
    glucocorticoids 427
  fish 429
  human 433
  invertebrates 430
Striatum
  adenosine A_2 receptors 169
  oxidative stress 3
Stroke
  excitotoxicity 618
  impairment of metabolism 615
  propriospinal premotoneurons 513
Substance P, nucleus tractus solitarius, cardiovascular control 39
Sulfakinins, insect abdominal ganglion 364, 367
Synaptic mechanisms, human neocortical neurons *in vitro* 528
Synaptic plasticity, modulation by adenosine A_2 receptors 177
Synaptic potentials, neocortex 134
Synaptic transmission, effect of pH changes 92

Tachykinins, nucleus tractus solitarius, cardiovascular control 39
Tachykinin-related peptides, insect abdominal ganglia 385
Taurine, insect abdominal ganglia 347
Terminal axonal sprouting 222
Testosterone, stress 593, 596
Δ^9-Tetrahydrocannabinol 276, 277
  analogs, therapeutic action 279
  neurobiological effects 296
Thalamus, glutamate receptors 56
  glial participation 65
  function 59, 63
  interaction with other transmitters and modulators 61
  location 58
Tocopherols, Parkinson's disease 10
Transcytosis 265
Transferrin receptors
  cerebral endothelial cells 265
  Parkinson's disease 8
Transforming growth factor-βs, in chromaffin cells 310, 313, 315
  functions 316
  neurotrophic activity 320
Transganglionic degenerative atrophy 120, 123
Transganglionic tracers 108, 120
Traumatic brain injury 146
  microglia
    facial nerve lesions 448
    ischaemic lesions 451
    optic nerve lesions 451
    regeneration 455
    stab lesions 452
trkA 225
Tyramine, insect nervous system 349
Tyrosine hydroxylase, insect abdominal ganglia 354, 403
Tysosine kinase growth factor receptors, G-protein receptor cross regulation 559

Undercut cortex 147, 148

Vasculature, effect of neonatal enucleation 196
Vasopressin, nucleus tractus solitarius, cardiovascular control 37
Vasopressin-like peptides, insects 389
Vasopressin receptor, nucleus tractus solitarius 38

Ventral unpaired median neurons, insect abdominal ganglia 339
Visual callosal connections, neonatal enucleation 195
Visual system, neonatal enucleation 191–218
  physiological changes in cortex 203
  structural changes in cortex 194
Vitamin E, Parkinson's disease 10

Wheatgerm agglutinin, axoplasmic transport 108
WIN 5608 277
WIN55212–2 277, 279, 281

Zinc metallothionein, 6-hydroxydopamine-mediated parkinsonism 5

LIST OF PREVIOUS REVIEW ARTICLES

VOLUME 32

H. PARNAS and L. A. SEGEL	Facilitation as a tool to study the entry of calcium and the mechanism of neurotransmitter release
T. L. TÖRÖK	Neurochemical transmission and the sodium-pump
A. SHOSAKU, Y. KAYAMA, I. SUMITOMO, M. SOGITANI and K. IWAMA	Analysis of recurrent inhibitory circuit in rat thalamus: Neurophysiology of the thalamic reticular nucleus
S. KOBAYASHI	Temperature-sensitive neurons in the hypothalamus: A new hypothesis that they act as thermostats, not as transducers
M. A. HOFMAN	On the evolution and geometry of the brain in mammals
H. MEIRI, Z. BAUM and Y. ROSENTHAL	Dynamic changes in sodium channels at demyelinated axons
R. WINKLBAUER	Development of the lateral line system in *Xenopus*
B. L. FINLAY and S. L. PALLAS	Control of cell number in the developing mammalian visual system
B. KOLB and I. Q. WHISHAW	Plasticity in the neocortex: Mechanisms underlying recovery from early brain damage
H. MATTHIES	In search of cellular mechanisms of memory
H. L. BORISON	Area postrema: Chemoreceptor circumventricular organ of the medulla oblongata
A. KIDMAN	Neurochemical and cognitive aspects of anxiety disorders
W. R. KLEMM	Drug effects on active immobility responses: What they tell us about neurotransmitter systems and motor functions
J.-P. TOUTANT	Insect acetylcholinesterase: Catalytic properties, tissue distribution and molecular forms
B. H. CHOI	The effects of methylmercury on the developing brain
R. J. HUXTABLE	Taurine in the central nervous system and the mammalian actions of taurine

VOLUME 33

M. YEADON and I. KITCHEN	Opioids and respiration
R. MILLER	Schizophrenia as a progressive disorder: Relations to EEG, CT, neuropathological and other evidence
F. L. STRAND, K. J. ROSE, J. A. KING, A. C. SEGARRA and L. A. ZUCCARELLI	ACTH modulation of nerve development and regeneration
R. D. FIELDS, J. M. LE BEAU, F. M. LONGO and M. H. ELLISMAN	Nerve regeneration through artificial tubular implants
A. NIIJIMA	Nervous regulation of metabolism
G. B. STEFANO	Role of opioid neuropeptides in immunoregulation
M. P. WITTER, H. J. GROENEWEGEN, F. H. LOPES DA SILVA and A. H. M. LOHMAN	Functional organization of the extrinsic and intrinsic circuitry of the parahippocampal region
R. H. EVANS	The pharmacology of segmental transmission in the spinal cord
A. PROCHAZKA	Sensorimotor gain control: A basic strategy of motor systems?
W. WALZ	Role of glial cells in the regulation of the brain ion microenvironment
A. ISHIDA-YAMAMOTO and M. TOHYAMA	Calcitonin gene-related peptide in the nervous tissue
T. S. LORIG	Human EEG and odor response
N. BEN-JONATHAN, L. A. ARBOGAST and J. F. HYDE	Neuroendocrine regulation of prolactin release

VOLUME 34

C. IDE, T. OSAWA and K. TOHYAMA	Nerve regeneration through allogeneic nerve grafts, with special reference to the role of the Schwann cell basal lamina
J. K. S. JANSEN and T. FLADBY	The perinatal reorganization of the innervation of skeletal muscle in mammals
J. L. WINSLOW	Analysis and numerical solution of the dendrite equation with synapses applied to cochlear neurons

Y. STERN	MPTP-induced Parkinsonism
M. SATOU	Synaptic organization, local neuronal circuitry, and functional segregation of the teleost olfactory bulb
R. MILLER, J. R. WICKENS and R. J. BENINGER	Dopamine D-1 and D-2 receptors in relation to reward and performance: a case for the D-1 receptor as a primary site of therapeutic action of neuroleptic drugs
J. M. DEL CORRAL, A. MIRALLES, M. C. NICOLAU, B. PLANAS and R. V. RIAL	Stereotaxic atlas for the lizard *Gallotia galloti*
K. KUBA and E. KUMAMOTO	Long-term potentiations in vertebrate synapses: A variety of cascades with common subprocesses
P. J. HARRISON and R. C. A. PEARSON	*In situ* hybridization histochemistry and the study of gene expression in the human brain
A. S. FENG, J. C. HALL and D. M. GOOLER	Neural basis of sound pattern recognition in anurans
W. DICKEY and J. I. MORROW	Drug-induced neurological disorders
D. COTARIU, J. L. ZAIDMAN and S. EVANS	Neurophysiological and biochemical changes evoked by valproic acid in the central nervous system
C. SUMMERS, L. M. MYERS, C. J. KALBERG and M. K. RAIZADA	Physiological and pharmacological comparisons of angiotensin II receptors in neuronal and astrocyte glial cultures
A. S. HORN	Dopamine uptake: A review of progress in the last decade
M. CHESLER	The regulation and modulation of pH in the nervous system
S. ITOH and A. TAKASHIMA	Neuropharmacological profile of V-9-M, a putative neuropeptide derived from procholecystokinin
G. I. HATTON	Emerging concepts of structure–function dynamics in adult brain: The hypothalamo–neurohypophysial system
S. NAKAMURA and T. SAKAGUCHI	Development and plasticity of the locus coeruleus: A review of recent physiological and pharmacological experimentation

VOLUME 35

M. J. TITMUS and D. S. FABER	Axotomy-induced alterations in the electrophysiological characteristics of neurons
A. M. THOMSON	Glycine is a coagonist at the NMDA receptor/channel complex
D. HERPIN	The effects of antihypertensive drugs on the cerebral blood flow and its regulation
R. FESCE	Stochastic approaches to the study of synaptic function
U. WINDHORST	Activation of Renshaw cells
K. G. HENDERSON and B. LINDVALL	Polymyositis and dermatomyositis 1990—diagnosis, treatment and prognosis
H. BENFENISTE and P. C. HUTTEMEIER	Microdialysis—theory and application
C. S. BOYAN and E. E. BALL	Neuronal organization and information processing in the wind-sensitive cercal receptor/giant interneurone system of the locust and other orthopteroid insects
M. ERECIŃSKA and I. A. SILVER	Metabolism and role of glutamate in mammalian brain
R. N. ADAMS	*In vivo* electrochemical measurements in the CNS
R. GRIFFITHS	Cysteine sulphinate (CSA) as an excitatory amino acid transmitter candidate in the mammalian central nervous system
J. M. OLCESE	The neurobiology of magnetic field detection in rodents
M. KUMADA, N. TERUI and T. KUWAKI	Arterial baroreceptor reflex: Its central and peripheral neural mechanisms
A. J. COPP, F. A. BROOK, J. P. ESTIBEIRO, A. S. W. SHUM and D. L. COCKROFT	The embryonic development of mammalian neural tube defects
W. WESEMANN and N. WEINER	Circadian rhythm of serotonin binding in rat brain
K. EZURE	Synaptic connections between medullary respiratory neurons and considerations on the genesis of respiratory rhythm
R. ANWYL	Neurophysiological actions of 5-hydroxytryptamine in the vertebrate nervous system

VOLUME 36

G. M. JONAKAIT, L. NI, P. D. WALKER and R. P. HART	Development of substance P (SP)-containing cells in the central nervous system: Consequences of neurotransmitter co-localization

A. J. SILVER and J. E. MORLEY	Role of CCK in regulation of food intake
L. SIVILOTTI and A. NISTRI	GABA receptor mechanisms in the central nervous system
W. VAN DER KLOOT	The regulation of quantal size
L. P. RENAUD and C. W. BOURQUE	Neurophysiology and neuropharmacology of hypothalamic magnocellular neurons secreting vasopressin and oxytocin
H. J. LITTLE	Mechanisms that may underlie the behavioural effects of ethanol
G. C. PAPADOPOULOS and J. G. PARNAVELAS	Monoamine systems in the cerebral cortex: Evidence for anatomical specificity
D. A. POWELL, S. L. BUCHANAN and L. L. HERNANDEZ	Classical (Pavlovian) conditioning models of age-related changes in associative learning and their neurobiological substrates
R. MILLER and R. J. BENINGER	On the interpretation of asymmetries of posture and locomotion produced with dopamine agonists in animals with unilateral depletion of striatal dopamine
S. E. FREEMAN and R. M. DAWSON	Tacrine: A pharmacological review
C. C. KING	Fractal and chaotic dynamics in nervous systems
R. HAWKES and C. GRAVEL	The modular cerebellum
R. W. GREENE and H. L. HAAS	The electrophysiology of adenosine in the mammalian central nervous system
J. W. UNGER, J. N. LIVINGSTON and A. M. MOSS	Insulin receptors in the central nervous system: Localization, signalling mechanisms and functional aspects
B. WALMSLEY	Central synaptic transmission: Studies at the connection between primary afferent fibres and dorsal spinocerebellar tract (DSCT) neurones in Clarke's column of the spinal cord
W. DICKEY	The neuroleptic malignant syndrome
R. J. HARVEY and R. M. A. NAPPER	Quantitative studies on the mammalian cerebellum
N. FALKE	Modulation of oxytocin and vasopressin release at the level of neurohypophysis
R. H. SCOTT, H. A. PEARSON and A. C. DOLPHIN	Aspects of vertebrate neuronal voltage-activated calcium currents and their regulation

VOLUME 37

E. W. LOTHMAN, E. H. BERTRAM III and J. L. STRINGER	Functional anatomy of hippocampal seizures
R. MONTEAU and G. HILAIRE	Spinal respiratory motoneurons
E. S. VIZI and E. LABOS	Non-synaptic interactions at presynaptic level
M. B. DUTIA	The muscles and joints of the neck: Their specialisation and role in head movement
D. R. NÄSSEL	Neurotransmitters and neuromodulators in the insect visual system
R. J. MILLER	The control of neuronal Ca^{2+} homeostasis
S. KATO, K. NEGISHI, T. TERANISHI and S. ISHITA	The use of the carp retina in neurobiology: Its uniqueness and application for neural network analyses of the inner retina
M. L. LANNOO, L. ROSS, L. MALER and R. HAWKES	Development of the cerebellum and its extracellular Purkinje cell projection in teleost fishes as determined by Zebrin II immuno-cytochemistry
G. E. DUNCAN and W. E. STUMPF	Brain activity patterns: Assessment by high resolution autoradiographic imaging of radiolabeled 2-deoxyglucose and glucose uptake
S. HAMPSON	Generalization and specialization in artificial neural networks
J.-P. ROYET	Stereology: A method for analyzing images
N. J. WOOLF	Cholinergic systems in mammalian brain and spinal cord
D. E. OORSCHOT, D. A. PETERSON and D. G. JONES	Neurite growth from, and neuronal survival within, cultured explants of the nervous system: A critical review of morphometric and stereological methods, and suggestions for the future

VOLUME 38

P. LEGENDRE and D. A. POULAIN	Intrinsic mechanisms involved in the electrophysiological properties of the vasopressin-releasing neurons of the hypothalamus
M. SCUKA and J. W. MOZRZYMAS	Postsynaptic potentiation and desensitization at the vertebrate end-plate receptors
J. MASSION	Movement, posture and equilibrium: Interaction and coordination

S. BERNATH	Calcium-independent release of amino acid neurotransmitters: Fact or artifact?
N. OKADO, H. SAKO, S. HOMMA and K. ISHIKAWA	Development of serotoninergic system in the brain and spinal cord of the chick
Y. DUMONT, J.-C. MARTEL, A. FOURNIER, S. ST-PIERRE and R. QUIRION	Neuropeptide Y and neuropeptide Y receptor subtypes in brain and peripheral tissues
B. B. STANFIELD	The development of the corticospinal projection
M. INOUE and M. YOSHII	Modulation of ion channels by somatostatin and acetylcholine
M. HAYASHI	Ontogeny of some neuropeptides in the primate brain
J. P. FRAHER	The CNS–PNS transitional zone of the rat. Morphometric studies at cranial and spinal levels
T. TANAKA, S. TANAKA, T. FUJITA, K. TAKANO, H. FUKUDA, K. SAKO and Y. YONEMASU	Experimental complex partial seizures induced by a microinjection of kainic acid into limbic structures
E. JANKOWSKA	Interneuronal relay in spinal pathways from proprioceptors
M. D. MAJEWSKA	Neurosteroids: Endogenous bimodal modulators of the $GABA_A$ receptor mechanism of action and physiological significance
R.-D. TREEDE, R. A. MEYER, S. N. RAJA and J. N. CAMPBELL	Peripheral and central mechanisms of cutaneous hyperalgesia
R. S. COHEN and D. W. PFAFF	Ventromedial hypothalamic neurons in the mediation of long-lasting effects of estrogen on lordosis behavior
P. SARANSAARI and S. S. OJA	Release of GABA and taurine from brain slices
K. ANDÔ	Cerebrovascular innervation of small bats
M. WOLMAN	Patterns of spread of different demyelinating processes in the myelin sheath
Y. TAKAHASHI	Gene expression in cells of the central nervous system
L. A. MARCO and R. S. JOSHI	A ketamine-induced rat model of tardive dyskinesia
C. P. LEBEL and S. C. BONDY	Oxidative damage and cerebral aging
K. WICTORIN	Anatomy and connectivity of intrastriatal striatal transplants

VOLUME 39

I. FERRER, E. SORIANO, J. A. DEL RIO, S. ALCANTARA and C. AULADELL	Cell death and removal in the cerebral cortex during development
K. V. BAEV and Y. P. SHIMANSKY	Principles of organization of neural systems controlling automatic movements in animals
J. M. BARNES and J. M. HENLEY	Molecular characteristics of excitatory amino acid receptors
J. C. SZERB and R. F. BUTTERWORTH	Effect of ammonium ions on synaptic transmission in the mammalian central nervous system
J. W. MILLER	The role of mesencephalic and thalamic arousal systems in experimental seizures
E. SIMON, R. GERSTBERGER and D. A. GRAY	Central nervous angiotensin II responsiveness in birds
T. TSUMOTO	Long-term potentiation and long-term depression in the neocortex
Y. KURACHI, R. T. TUNG, H. ITO and T. NAKAJIMA	G protein activation of cardiac muscarinic K+ channels
J. R. BLACKBURN, J. G. PFAUS and A. G. PHILLIPS	Dopamine functions in appetitive and defensive behaviours
J. PUYMIRAT	Thyroid receptors in the rat brain
C. F. ZORUMSKI and L. L. THIO	Properties of vertebrate glutamate receptors: Calcium mobilization and desensitization
D. A. MCCORMICK	Neurotransmitter actions in the thalamus and cerebral cortex and their role in neuromodulation of thalamocortical activity
M. KOSSUT	Plasticity of the barrel cortex neurons
J. S. KING, S. L. CUMMINGS and G. A. BISHOP	Peptides in cerebellar circuits
T. GOTOW	The cytoplasmic structure of the axon terminal
G. A. BISHOP and C. W. KERR	The physiological effects of peptides and serotonin on purkinje cell activity
P. A. FUCHS	Ionic currents in cochlear hair cells

G. D. ROSEN, G. F. SHERMAN and A. M. GALABURDA — Biological substrates of anatomic asymmetry
P. T. FRANCIS, M. N. PANGALOS and D. M. BOWEN — Animal and drug modelling for Alzheimer synaptic pathology
G. VAN DEN BERGHE, F. BONTEMPS, M. F. VINCENT and F. VAN DEN BERGH — The purine nucleotide cycle and its molecular defects
J. DEFELIPE and I. FARINAS — The pyramidal neuron of the cerebral cortex: Morphological and chemical characteristics of the synaptic inputs
K. FUKUSHIMA, C. R. S. KANEKO and A. F. FUCHS — The neuronal substrate of integration in the oculomotor system

VOLUME 40

C. R. GARDNER, W. R. TULLY and C. J. R. HEDGECOCK — The rapidly expanding range of neuronal benzodiazepine receptor ligands
C. BUISSERET-DELMAS and P. ANGAUT — The cerebellar olivo-corticonuclear connections in the rat
H. MEIRI, E. BANIN, M. ROLL and A. ROUSSEAU — Toxic effects of aluminium on nerve cells and synaptic transmission
P. I. PAKHOTIN, I. D. PAKHOTINA and A. B. BELOUSOV — The study of brain slices from hibernating mammals *in vitro* and some approaches to the analysis of hibernation problems *in vivo*
A NEHLIG and A. PEREIRA DE VASCONCELOS — Glucose and ketone body utilization by the brain of neonatal rats
B. B. RUZICKA and K. H. JHAMANDAS — Excitatory amino acid action on the release of brain neurotransmitters and neuromodulations: Biochemical studies
R. LENT and S. L. SCHMIDT — The ontogenesis of the forebrain commissures and the determination of brain asymmetrics
G. G. HADDAD and C. JIANG — O_2 deprivation in the central nervous system: On mechanisms of neuronal response, differential sensitivity and injury
C. HILDEBRAND, S. REMAHL, H. PERSSON and C. BJARIMAR — Myelinated nerve fibres in the CNS
M. TAKATA — Two types of inhibitory postsynaptic potentials in the hypoglossal motoneurons
E. J. WARRANT and P. D. MCINTYRE — Arthropod eye design and the physical limits to spatial resolving power
G. NISTICÒ — Communications among central nervous system, neuroendocrine and immune systems: Interleukin-2
E. HÖSLI and L. HÖSLI — Receptors for neurotransmitters on astrocytes in the mammalian central nervous system
J. S. HONG, J. F. MCGINTYL, P. H. K. LEE, C. W. XIE and C. L. MITCHELL — Relationship between hippocampal opioid peptides and seizures
S. MIHARA — Intracellular recordings from neurons of the submucous plexus
M. H. WHITNALL — Regulation of the hypothalamic corticotropin-releasing hormone neurosecretory system
T. A. LOVICK — Integrated activity of cardiovascular and pain regulatory systems: Role in adaptive behavioural responses
H. HARA, T. SUKAMOTO and K. KOGURE — Mechanism and pathogenesis of ischemia-induced neuronal damage
N. LINDEFORS, A. LINDÉN, S. BRENÉ, G. SENDVALL and H. PERSSON — CCK peptides and mRNA in the human brain
A. PERTOVAARA — Antinuciception induced by alpha-2-adrenoceptor agonists, with special emphasis on medefomidine studies
I. MERCHENTHALER, F. J. LÓPEZ and A. NEGRO-VILAR — Anatomy and physiology of central galanin-containing pathways

VOLUME 41

P. BALABAN — Behavioural neurobiology of learning in terrestrial snails
M. TAKANO and A. NOMA — The ATP-sensitive K^+ channel
J. MASSOULIE, L. PEZZEMENTI, S. BON, E. KREJCI and F.-M. VALLETTES — Molecular and cellular biology of cholinesterases
R. NAVARRETE and G. VRBOVA — Activity-dependent interactions between motoneurons and muscles: Their role in the development of the motor unit

M. W. SALTER, Y. DE KONINCK and J. L. HENRY	Physiological roles for adenosine and ATP in synaptic transmission in the spinal dorsal horn
B. H. BLAND and L. V. COLOM	Extrinsic and intrinsic properties underlying oscillation and synchrony in limbic cortex
J. D. COOPER and O. T. PHILLIPSON	Central neuroanatomical organisation of the rat visuomotor system
C. H. HORNER	Plasticity of the dendritic spine
H. M. SINNAMON	Preoptic and hypothalamic neurons and the initiation of locomotion in the anesthetized rat
L. AITKIN and V. PARK	Audition and the auditory pathway of a vocal new world primate, the common marmoset
R. E. DUSTMAN, D. E. SHEARER and R. Y. EMMERSON	EEG and event-related potentials in normal aging
B. J. DENNIS and S. T. MELLER	Investigations on the periaqueductal gray (PAG) of the rabbit: With consideration of experimental procedures and functional roles of the PAG
G. R. BARNES	Visual–vestibular interaction in the control of head and eye movement: The role of visual feedback and predictive mechanisms
L. H. LAZARUS and M. ATTILA	The toad, ugly and venomous, wears yet a precious jewel in his skin
R. L. PAPKE	The kinetic properties of neuronal nicotinic receptors: Genetic basis of functional diversity
M. S. ALDRICH	The neurobiology of narcolepsy–cataplexy
K. TOYAMA, Y. KOMATSU, N. YAMAMOTO and T. KUROTANI	*In vitro* studies of visual cortical development and plasticity
C. A. PORRO and M. CAVAZZUTI	Spatial and temporal aspects of spinal cord and brainstem activation in the formalin pain model
A. J. TODD and R. C. SPIKE	The localization of classical transmitters and neuropeptides within neurons in laminae I–III of the mammalian spinal dorsal horn
V. REGHUNANDANAN, R. REGHUNANDANAN and P. I. SINGH	Neurotransmitters of the suprachiasmatic nucleus: Role in the regulation of circadian rhythms
G. S. BOYAN and E. E. BALL	The grasshopper, *Drosophila* and neuronal homology (advantages of the insect nervous system for the neuroscientist)
M. SENSENBRENNER	The neurotrophic activity of fibroblast growth factors
U. PROSKE, D. L. MORGAN and J. E. GREGORY	Thixotropy in skeletal muscle and in muscle spindles: A review
J. HERBERT	Peptides in the limbic system: Neurochemical codes for co-ordinated adaptive responses to behavioural and physiological demand

VOLUME 42

G. SPERK	Kainic acid seizures in the rat
A. DEPAULIS, M. VERGNES and C. MARESCAUX	Endogenous control of epilepsy: The nigral inhibitory system
K. KITAHAMA, T. MAEDA, R. M. DENNEY and M. JOUVET	Monoamine oxidase: Distribution in the cat brain studied by enzyme- and immunohistochemistry: Recent progress
J. BELL, S. BOLANOWSKI and M. H. HOLMES	The structure and function of pacinian corpuscles: A review
S. R. VINCENT	Nitric oxide; a radical neurotransmitter in the central nervous system
E. SCHERINI and G. BERNOCCHI	*Cis*DDP treatment and development of the rat cerebellum
R. A. L. DAMPNEY	The subretrofacial vasomotor nucleus: Anatomical, chemical and pharmacological properties and role in cardiovascular regulation
S. HAMPSON	Problem solving in artificial neural networks
GUEST EDITOR: R. W. DAVIES	Life and death in the nervous system (The Robertson Symposium)
E. HAFEN, B. DICKSON, D. BRUNNER and T. RAABE	Genetic dissection of signal transduction mediated by the sevenless receptor tyrosine kinase in *Drosophila*
F. HUANG, C. DAMBLY-CHAUDIÈRE and A. GHYSEN	Position-reading and the emergence of sense organ precursors in *Drosophila*
J. W. SENTRY, S. F. GOODWIN, C. D. MILLIGAN, A. DUNCANSON, M. YANG and K. KAISER	Reverse genetics of *Drosophila* brain structure and function

A. JOLIOT, I. LE ROUX, M. VOLOVITCH, E. BLOCH-GALLEGO and A. PROCHIANTZ	Neurotrophic activity of a homeobox peptide
H. JOCKUSCH, K. KAUPMANN, M. GRONEMEIER, M. SCHLEEF and R. KLOCKE	Exploring the mammalian neuromuscular system by analysis of mutations: Spinal muscular atrophy and mytonia
R. W. DAVIES, E. J. GALLAGHER and A. SAVIOZ	Reverse genetics of the mouse central nervous system: Targeted genetic analysis of neuropeptide function and reverse genetic screens for genes involved in human neurodegenerative disease
S. BLACKSHAW	Cellular and molecular approaches to neural repair in the medicinal leech
S. KORNEEV, S. BLACKSHAW and J. A. DAVIES	cDNA libraries from a few neural cells
G. DECHANT, A. RODRÍGUEZ-TÉBAR and Y.-A. BARDE	Neurotrophin receptors
R. SCHOEPFER, H. MONYER, B. SOMMER, W. WISDEN, R. SPRENGEL, T. KUNER, H. LOMELI, A. HERB, M. KÖHLER, N. BURNASHEV, W. GÜNTHER, P. RUPPERSBERG and P. SEEBURG	Molecular biology of glutamate receptors
U. LÖNNENDONKER	Use dependence of guanidinium toxins in frog myelinated nerve: Evidence for features of native voltage-gated sodium channels
M. D. BERRY, A. V. JUORIO and I A. PATERSON	The functional role of monoamine oxidases A and B in the mammalian central nervous system
T. G. SMART, X. XIE and B. J. KRISHEK	Modulation of inhibitory and excitatory amino acid receptor ion channels by zinc
J. W. PHILLIS	A "radical" view of cerebral ischemic injury
K. P. ABLE	Magnetic orientation and magnetoreception in birds
G. B. STEFANO, T. V. BILFINGER and G. L. FRICCHIONE	The immune-neuro-link and the macrophage: Postcardiotomy delirium, HIV-associated dementia and psychiatry
K. KAILA	Ionic basis of $GABA_A$, receptor channel function in the nervous system
M. VERHAGE, W. E. J. M. GHIJSEN and F. H. LOPES DA SILVA	Presynaptic plasticity: The regulation of Ca^{2+}-dependent transmitter release
S. M. THOMPSON	Modulation of inhibitory synaptic transmission in the hippocampus
J. R. ELLIOTT and A. A. ELLIOTT	The effects of alcohols and other surface-active compounds on neuronal sodium channels
K. ONODERA, A. YAMATODANI, T. WATANABE and H. WADA	Neuropharmacology of the histaminergic neuron system in the brain and its relationship with behavioral disorders
K. IKEDA, H. SUNOSE and T. TAKASAKA	Ion transport mechanisms in the outer hair cell of the mammalian cochlea
C. M. A. PENNARTZ, H. J. GROENEWEGEN and F. H. LOPES DA SILVA	The nucleus accumbens as a complex of functionally distinct neuronal ensembles: An integration of behavioural, electrophysiological and anatomical data

VOLUME 43

M. JOËLS and E. R. DE KLOET	Mineralocorticoid and glucocorticoid receptors in the brain. Implications for ion permeability and transmitter systems
M. ERECIŃSKA and I. A. SILVER	Ions and energy in mammalian brain
N. AKAIKE and S. UENO	Proton-induced current in neuronal cells
C. HILDEBRAND, C. M. BOWE and I. N. REMAHL	Myelination and myelin sheath remodelling in normal and pathological PNS nerve fibres
N. J. SCOLDING, J. P. ZAJICEK, N. WOOD and D. A. S. COMPSTON	The pathogenesis of demyelinating disease
H. MEVES	Modulation of ion channels by arachidonic acid
P. J. EVANS, R. MIDHA and S. E. MACKINNON	The peripheral nerve allograft: A comprehensive review of regeneration and neuroimmunology
K. C. WADHWANI and S. I. RAPOPORT	Transport properties of vertebrate blood–nerve barrier: Comparison with blood–brain barrier
S. E. DRYER	Functional development of the parasympathetic neurons of the avian ciliary ganglion: A classic model system for the study of neuronal differentiation and development
R. W. BANKS	The motor innervation of mammalian muscle spindles

J. SIRVIÖ, P. RIEKKINEN, JR, P. JÄKÄLÄ and P. J. RIEKKINEN	Experimental studies on the role of serotonin in cognition
G. H. HENRY, A. MICHALSKI, B. M. WIMBORNE and R. J. MCCART	The nature and origin of orientation specificity in neurons of the visual pathways
P. A. SMITH	Amphibian sympathetic ganglia: An owner's and operator's manual
C. K. DAMER and C. E. CREUTZ	Secretory and synaptic vesicle membrane proteins and their possible roles in regulated exocytosis
G. V. REBEC and R. C. PIERCE	A vitamin as neuromodulator: Ascorbate release into the extracellular fluid of the brain regulates dopaminergic and glutamatergic transmission
H.-J. HÄBLER, W. JÄNIG and M. MICHAELIS	Respiratory modulation in the activity of sympathetic neurones

VOLUME 44

J.-P. HERMAN and N. D. ABROUS	Dopaminergic neural grafts after fifteen years: Results and perspectives
W. W. BLESSING, Z.-Q. DING, Y.-W. LI, Z. J. GIEROBA, A. J. WILSON, P. G. HALLSWORTH and S. L. WESSELINGH	Transneuronal labelling of CNS neurons with herpes simplex virus
S. S. SMITH	Female sex steroid hormones: From receptors to networks to performance—actions on the sensorimotor system
R. A. KAUPPINEN and S. R. WILLIAMS	Nuclear magnetic resonance spectroscopy studies of the brain
I. S. MCLENNAN	Neurogenic and myogenic regulation of skeletal muscle formation: A critical re-evaluation
M. D. BERRY, A. V. JUORIO and I. A. PATTERSON	Possible mechanisms of action of (−)deprenyl and other MAO-B inhibitors in some neurologic and psychiatric disorders
R. KÖTTER	Postsynaptic integration of glutamatergic and dopaminergic signals in the striatum
M.-K. SUN and D. J. REIS	Central neural mechanisms mediating excitation of sympathetic neurons by hypoxia
R. M. RIDLEY	The psychology of perseverative and stereotyped behaviour
D. E. OORSCHOT	Are you using neuronal densities, synaptic densities or neurochemical densities as your definitive data? There is a better way to go
H. YAGINUMA, T. SHIGA and R. W. OPPENHEIM	Early developmental patterns and mechanisms of axonal guidance of spinal interneurons in the chick embryo spinal cord
L. M. GARCÍA-SEGURA, J. A. CHOWEN, A. PÁRDUCZ and F. NAFTOLIN	Gonadal hormones as promoters of structural synaptic plasticity: Cellular mechanisms
T. J. COLLIER and J. E. SPRINGER	Neural graft augmentation through co-grafting: Implantation of cells as sources of survival and growth factors
E. M. LIEBERMAN, P. T. HARGITTAI and R. M. GROSSFELD	Electrophysiological and metabolic interactions between axons and glia in crayfish and squid
N. C. DANBOLT	The high affinity uptake system for excitatory amino acids in the brain
B. SCHÖBITZ, E. R. DE KLOET and F. HOLSBOER	Gene expression and function of interleukin 1, interleukin 6 and tumor necrosis factor in the brain
J. H. BENINGTON and H. C. HELLER	Does the function of REM sleep concern non-REM sleep or waking?
G. BONANNO and M. RAITERI	Release-regulating presynaptic heterocarriers
A. R. GREEN and A. J. CROSS	The neuroprotective actions of chlormethiazole
Y. SHEN, S. M. SPECHT, I. DE SAINT GHISLAIN and R. LI	The hippocampus: A biological model for studying learning and memory
K. D. BECK	Functions of brain-derived neurotrophic factor, insulin-like growth factor-I and basic fibroblast growth factor in the development and maintenance of dopaminergic neurons
M. J. AZANZA and A. DEL MORAL	Cell membrane biochemistry and neurobiological approach to biomagnetism

VOLUME 45

C. A. MAGGI	Tachykinins and calcitonin gene-related peptide (CGRP) as co-transmitters released from peripheral endings of sensory nerves

R. J. HARVEY	Can computers think? Differences and similarities between computers and brains
S. FELDMAN and J. WEIDENFELD	Neural mechanisms involved in the corticosteroid feedback effects on the hypothalamo-pituitary-adrenocortical axis
M. FROTSCHER, S. ZAFIROV and B. HEIMRICH	Development of identified neuronal types and of specific synaptic connections in slice cultures of rat hippocampus
C. HILDEBRAND, K. FRIED, F. TUISKU and C. S. JOHANSSON	Teeth and tooth nerves
Y. GEINISMAN, L. DETOLEDO-MORRELL, F. MORRELL and R. E. HELLER	Hippocampal markers of age-related memory dysfunction: Behavioral, electrophysiological and morphological perspectives
S. M. O'MARA	Spatially selective firing properties of hippocampal formation neurons in rodents and primates
M. DULCE MADEIRA and A. R. LIEBERMAN	Sexual dimorphism in the mammalian limbic system
C. L. DARLINGTON, J. P. GALLAGHER and P. F. SMITH	*In vitro* electrophysiological studies of the vestibular nucleus complex
J. H. BENINGTON and H. C. HELLER	Restoration of brain energy metabolism as the function of sleep
J. KIEN and J. S. ALTMAN	Modelling the generation of long-term neuronal activity underlying behaviour
J. P. GALLAGHER, F. ZHENG, H. HASUO and P. SHINNICK-GALLAGHER	Activities of neurons within the rat dorsolateral septal nucleus (DLSN)
L. LARSSON and T. ANSVED	Effects of ageing on the motor unit
T. AKASU and T. NISHIMURA	Synaptic transmission and function of parasympathetic ganglia
O. S. VINOGRADOVA	Expression, control, and probable functional significance of the neuronal theta-rhythm
K. MORI and Y. YOSHIHARA	Molecular recognition and olfactory processing in the mammalian olfactory system

VOLUME 46

G. A. KERKUT and J. BAGUST	The isolated mammalian spinal cord
R. FISCHER-COLBRIE, A. LASLOP and R. KIRCHMAIR	Secretogranin II: Molecular properties, regulation of biosynthesis and processing to the neuropeptide secretoneurin
G. FANÒ, S. BIOCCA, S. FULLE, M. A. MARIGGIÒ, S. BELIA and P. CALISANO	The S-100: A protein family in search of a function
G. AHNERT-HILGER and H. BIGALKE	Molecular aspects of tetanus and botulinum neurotoxin poisoning
N. DIERINGER	'Vestibular compensation', neural plasticity and its relations to functional recovery after labyrinthine lesions in frogs and other vertebrates
A. PARENT, P.-V. CÔTÉ and B. LAVOIE	Chemical anatomy of primate basal ganglia
M. K. HORNE and E. G. BUTLER	The role of the cerebello-thalamo-cortical pathway in skilled movement
C. W. VAUGHAN and P. M. SATCHELL	Urine storage mechanisms
T. SATO, Y. OKADA and T. MIYAMOTO	Molecular mechanisms of gustatory transductions in frog taste cells
S. B. MOFFETT	Neural regeneration in gastropod mulluscs
M. R. BENNETT	The origin of Gaussian distributions of synaptic potentials
F. OSCULATI and A. SBARBATI	The frog taste disc: A prototype of the vertebrate *gustatory* organ
T. ONO, H. NISHIJO and T. UWANO	Amygdala role in conditioned associative learning
U. MISGELD, M. BIJAK and W. JAROLIMEK	A physiological role for $GABA_B$ receptors and the effects of baclofen in the mammalian central nervous system
T. J. EBNER and G. CHEN	Use of voltage-sensitive dyes and optical recordings in the central nervous system
K. A. CZECH and J. SAGEN	Update on cellular transplantation into the CNS as a novel therapy for chronic pain
G. TSAI and J. T. COYLE	*N*-Acetylaspartate in neuropsychiatric disorders
M. A. KHAN	Effects of myotoxins on skeletal muscle fibers
L. F. AGNATI, P. CORTELLI, R. PETTERSSON and K. FUXE	The concept of trophic units in the central nervous system

M. M. BEHBEHANI	Functional characteristics of the midbrain periaqueductal gray
H. KATSUKI and S. OKUDA	Arachidonic acid as a neurotoxic and neurotrophic substance

VOLUME 47

W. L. INGLIS and P. WINN	The pedunculopontine tegmental nucleus: Where the striatum meets the reticular formation
W.-M. FU	Regulatory role of ATP at developing neuromuscular junctions
L. STJÄRNE and E. STJÄRNE	Geometry, kinetics and plasticity of release and clearance of ATP and noradrenaline as sympathetic cotransmitters: Roles for the neurogenic contraction
N. A. SHAW	The temporal relationship between the brainstem and primary cortical auditory evoked potentials
N. B. REESE, E. GARCIA-RILL and R. D. SKINNER	The pedunculopontine nucleus—auditory input, arousal and pathophysiology
I. NARUSE and H. KEINO	Apoptosis in the developing CNS
MIAO-KUN SUN	Central neural organization and control of sympathetic nervous system in mammals
A. ARGIOLAS and M. R. MELIS	Neuromodulation of penile erection: An overview of the role of neurotransmitters and neuropeptides
P. GASS and T. HERDEGEN	Neuronal expression of AP-1 proteins in excitotoxic–neurodegenerative disorders and following nerve fiber lesions
W. E. ARMSTRONG	Morphological and electrophysiological classification of hypothalamic supraoptic neurons
F. ROSSI and P. STRATA	Reciprocal trophic interactions in the adult climbing fibre–purkinje cell system
R. M. ZACHARKO, D. KOSZYCKI, P. D. MENDELLA and J. BRADWEJN	Behavioral, neurochemical, anatomical and electrophysiological correlates of panic disorder: Multiple transmitter interaction and neuropeptide colocalization
C. R. GALE and C. N. MARTYN	Migrant studies in multiple sclerosis
J.-L. PUEL	Chemical synaptic transmission in the cochlea
H. F. BRADFORD	Glutamate, GABA and epilepsy
J. G. MCLARNON	Potassium currents in motoneurones
R. B. STEIN	Presynaptic inhibition in humans
R. A. KAUPPINEN and L. I. ALHONEN	Transgenic animals as models in the study of the neurobiological role of polyamines

ELSEVIER SCIENCE

World Class Publishing

Advertising

Question

Do you want to influence opinion formers & decision makers?

Answer

Advertising in this journal can provide you with that influence.

PLEASE CONTACT

INTERNATIONAL:
Paul Titcombe
Advertising Sales Manager
Elsevier Science Ltd
The Boulevard
Langford Lane
Kidlington
Oxford OX5 1GB
Tel (+44) (0)1865 843566
Fax (+44) (0)1865 843976

USA/CANADA:
Daniel S Lipner
Weston Media Associates
P O Box 1110
Greens Farms
CT 06436-1110, USA
Tel 203 261-2500
Fax 203 261-0101

JAPAN:
Fukiko Ogura
Elsevier Science Japan
9-15 Higashi-Azabu 1-chome
Minato-ku
Tokyo 106
Japan
Tel (00) 81 3 5561 5031
Fax (00) 81 3 5561 5045/5047

You Benefit With Disk Submission

Elsevier Science encourages the submission of articles on disk. We want Authors to provide us with their final manuscripts directly from their computer or word processing systems, without the need to follow complicated instructions. If you submit electronic manuscripts, you will notice the benefits:

- **A speedier publication process**
- **A clearer set of proofs, with fewer errors**

  Providing electronic manuscripts will improve the delivery of proofs - delivery will be faster and more reliable. Also, without needing to rekey the text the possibility of introducing errors will be avoided
- **Inclusion in an electronic archive**

  Elsevier Science is committed to developing and maintaining electronic archives for all of its journals. This will provide the flexibility to take advantage of electronic media to disseminate the information published in our journals, including your article.

There are some basic points to be kept in mind and we do have certain preferences. However, with Elsevier's expertise and facilities it does not really matter on which computer or wordprocessing system your manuscript has been prepared.

Basic Points to Help Us

Delivery of Electronic Files
Disks must be clearly marked with the following information:

- **Operating system**
- **Disk format (e.g.DS/DD)**
- **Word Processor used, including version number (users of see later)**
- **Authors' names**
- **Short title of article**

Three printed copies of the final version of the manuscript should be submitted with the disk to the Journal Editor.
In the event of differences between disk and hardcopy, the hardcopy will be considered as the definitive version.

Preparing Electronic Text Files

Please follow the general instructions on style and arrangement and, inparticular, the reference style as given in Notes for Authors for the book or journal concerned. If you are contributing to a multi-author work, please consult the publisher or earlier volume for style conventions with respect to headings, reference citation, etc.

$LaTeX/TeX$

Authors wishing to submit their article as a $LaTeX/TeX$ file should note the following:
Authors should ideally use the "Article" style or the Elsevier $LaTeX$ package which is available via anonymous FTP from CTAN centres.
(Further details on TeX can be obtained from Martin Key or Sebastian Rahtz)

Host names:	**CTAN directory:**
ftp.dante.de	/tex-archive/macros/latex/contrib/supported/elsevier
ftp.tex.ac.uk	/tex-archive/macros/latex/contrib/supported/elsevier
ftp.shsu.edu	/tex-archive/macros/latex/contrib/supported/elsevier

Authors should not add their own macros

Preparing Electronic Graphic Files

Illustrations should be produced in the Macintosh environment if possible using the following software packages:

Adobe Illustrator, Aldus Freehand, Cricket Graph, Macdraw, Chemdraw, Corel Draw for PC

However we will accept any of the popular drawing programs for the Macintosh and PC.
Artwork should be drawn for finished size using a Times or Helvetica typeface at a final size of 8pt type with appropriate lineweights.
Please indicate format, operating system, program and version number of the software used. If possible also print a directory of filenames.
Scanned artwork should be saved to Tiff format for both line and halftone and scanned at a suggested setting of 400 dpi for half-tones and 1000 dpi for linework. If it is necessary to compress the scans please indicate the software used. It is essential that a hard copy print of the scans be included. Illustrations should be logically named and saved as individual files to 3.5" disk or a SyQuest cartridge 44Mbyte or 88Mbyte. If 3.5" disks are not available to you, 5.25" disks are acceptable. Please send a laser print of the artwork with the electronic file.
When submitting electronic colour images please indicate the file format and program used (including compression software). Include a 4 colour machine or cromalin proof and check that all the separations (if provided) are colour identified.

If you require any further information please contact the following:

Elsevier Science Ltd
The Boulevard
Langford Lane
Kidlington
Oxford
OX5 1GB
UK

The Production Methods Department (Text)
Tel: 44 1865 843484
Fax: 44 1865 843905
Email:nme@elsevier.co.uk

Phil Halsey (Graphics)
Tel: 44 1865 843305
Fax: 44 1865 843921
Email:p.halsey@elsevier.co.uk.

Elsevier Science Inc
655 Avenue of the Americas
New York
NY 10010-5107
USA

Tom Lewis Flood
(Text/Graphics)
Tel: 212 633-3855
Fax: 212 633-3658
Email:t.lewisflood@elsevier.com

ELSEVIER SCIENCE

CO611